C.da Cerreto, 55 - 66010 MIGLIANICO (CH) – Italy Tel. (+39) 0871/950329 Fax (+39) 0871/950687
http://www.caldaiedalessandro.it e-mail: info@caldaiedalessandro.it

Wood biomass heat generator

Series CS SMALL
Models from 20 to 100

USE AND MAINTENANCE GUIDE

Ver. 1.0 - QCSSMALLXIT0114

Flue

The flue represents one of the fundamental elements of the heat generator. The correct designing of the fumes evacuation system guarantees the correct and always efficient generator functioning and prevents the potentially dangerous situations for the user.
For a correct installation, refer to section 6.5 pag.17 of this manual and, however, use experienced staff.

Fire—resistant

It is essential for the first ignition to be gradual without bringing the generator to maximum temperature, to avoid the fire-resistant material inside the combustion chamber from being damaged. Re-start the generator and bring it to maximum temperature and, therefore, at normal functioning only after cooling.

Electrical connections

The generator is equipped with a main switch **not automatic ISOLATOR type.**
It is recommended to protect the power supply line using a differential magnetothermic switch.

Refer to the attached control board manual for electrical connections.

CONTENTS

1. GENERAL INFORMATION

1.1 Identification and purpose of the document

This instruction guide drafted by D'ALESSANDRO TERMOMECCANICA is an integral part of the heat generator. Any reproduction, even partial, is prohibited.
The aim of this manual is to provide all the necessary information for a correct use guaranteeing maximum safety for people, animals and objects.

The company D'Alessandro Termomeccanica is clearly indicated as **Manufacturer**, in compliance with Directive 2006/42 EEC, by means of the following documents:

- **Declaration of conformity**
- **CE Marking**
- **Use and maintenance guide**

The legal name of the manufacturer is:

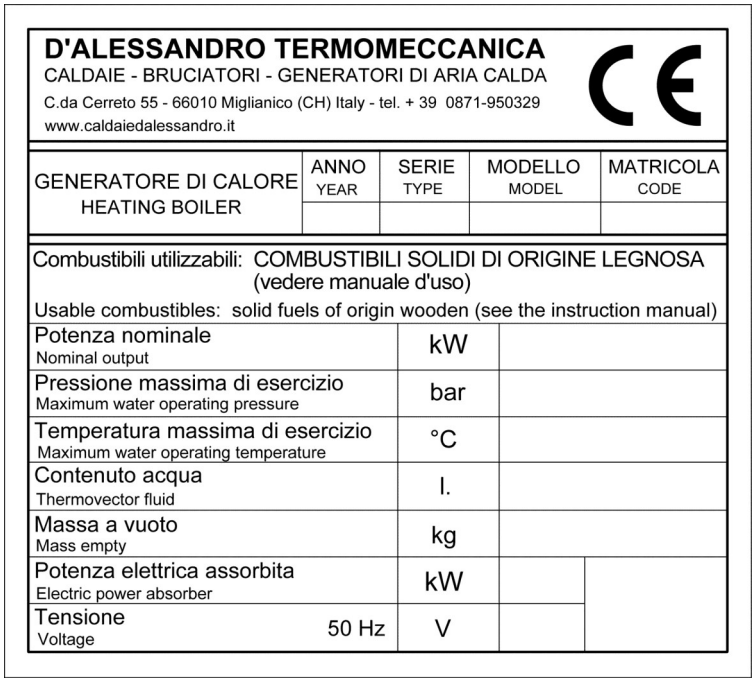
D'Alessandro Termomeccanica - C.da Cerreto 55
66016 Miglianico (CH) - Italia

As displayed on the identification plate on the left panel of the generator with the CE marking.

1.2 Identification plate

The plate installed on the generator displays the legal name of the manufacturer together with the following details:

- Year of manufacture
- Series
- model
- Serial number
- Nominal power
- Maximum working pressure
- Maximum working temperature
- Water content
- Empty weight
- Power consumption
- Mains voltage



D'ALESSANDRO TERMOMECCANICA
CALDAIE - BRUCIATORI - GENERATORI DI ARIA CALDA
C.da Cerreto 55 - 66010 Miglianico (CH) Italy - tel. + 39 0871-950329
www.caldaiedalessandro.it

CE

GENERATORE DI CALORE HEATING BOILER	ANNO YEAR	SERIE TYPE	MODELLO MODEL	MATRICOLA CODE

Combustibili utilizzabili: COMBUSTIBILI SOLIDI DI ORIGINE LEGNOSA (vedere manuale d'uso)
Usable combustibles: solid fuels of origin wooden (see the instruction manual)

Potenza nominale / Nominal output	kW		
Pressione massima di esercizio / Maximum water operating pressure	bar		
Temperatura massima di esercizio / Maximum water operating temperature	°C		
Contenuto acqua / Thermovector fluid	l.		
Massa a vuoto / Mass empty	kg		
Potenza elettrica assorbita / Electric power absorber	kW		
Tensione / Voltage 50 Hz	V		

1.3 CE marking

The plate with the legal name of the manufacturer, the machine identification data, the CE marking and the declaration of conformità enclosed certify that the machine complies with the applicable European Directives.

1.4 Reference standards

This manual has been written in compliance with the following Directives, Laws and Standards:

1. Directive **85/374/CEE** on responsability for defective products
2. Directive **92/59/ CEE** on General Safety of products
3. Directive **2006/42/CE** on Machinery safety
4. Directive **2006/95/CE** on electrical material safety
5. Directive **2004/108/CE** on electromagnetic compatibility
6. Directive **89/106/CEE** on manufacturing products
7. Technical standard **UNI EN 12100-1/2** on machinery safety (Principals)
8. Technical standard **UNI EN 1050** on machinery safety (Principles for risk evaluation)
9. Technical standard **CEI EN 60204-1** on machinery safety (Electrical equipment)

1.5 Typographic Comventions

Special attention must be paid to the parts of this user guide marked with the symbols listed below:

ATTENTION!	 **IMPORTANT**	 **MANDATORY**
WARNING!	 **DANGER**	 **PROHIBITED**

1.6 Guarantee and liability

The guarantee refers to both the mechanical and electrical parts of the generator, in compliance with the European Directive 1999/44/EC, which protects the user against construction defects for a period of two years.

The guarantee is void in case of damages due to:

- Transport and/or handling (if charged to the customer);
- Assembly errors by the installer;
- Failure to comply with the maintenance and cleaning instructions described in this manual;
- Failures and/or breaks not due to the malfunction of the machine itself;
- Reasons not due to the manufacturer

The guarantee is valid only for the original customer and only when he/she becomes exclusive owner of the machine.

Any controversy between D'Alessandro Termomeccanica and the purchaser are settled by arbitration; in case of non-agreement upon the arbitration board, the place of jurisdiction shall be Chieti. The aforementioned points are contained in the general conditions of sale, which are an integrated part of the purchase agreement. Refer to the general conditions of sale also for cases not mentioned in this document.
Guarantee or manufacturer liability cannot be called upon in case of damages to people and/or objects due to:

- Incorrect installation of the machine
- Improper use of generator
- Modifications to the generator

2. SAFETY AND RESIDUAL RISKS

2.1 Risks connected to the use of the machine

The generator is built in compliance with the main safety requirements laid down in the European Directives.
The European and National Standards concerning the safety of this type of machine have been considered during the design stage, taking the state of the art into account.
However, hazardous situations may arise in case:
The generator is used improperly.
The generator is installed by non-qualified personnel.
Instructions regarding safety contained in this manual are not complied with.

2.2 Residual risks

The generator has been designed and built in compliance with all the current applicable Safety Standards. Although every possible risk has been considered compared to what the currrent Standard states, it is possible that besides the risks deriving from improper use, the following risks may occur:

BURNING HAZARD
When starting the firebox, accessing the inspection doors or cleaning while the firebox is not completely off.

ELECTROCUTION HAZARD
The generator is connected to and controlled by an electrical panel equipped with all the protection devices against overloads ans short circuits. To protect against the indirect contacts, we recommend powering the panel with a line protected by **differential switch** with intervention threshold not higher than **30 mA**.

HAND INJURY HAZARD
During cleaning or maintenance operations on the fuel feeding screw.

FINGER INJURY HAZARD
During control and maintenance operations on chain transmission components located in correspondence of the gearmotor.

SUSPENDED LOAD HAZARD
During generator transport and handling operations

ASPHYXIATION HAZARD
In case of inadeguate fume evacuation (draught). We recommend periodically cleaning the generator flue, tube nest and firebox thoroughly.

PROTECTIVE GLOVES ARE MANDATORY
Protective gloves must be used during all maintenance and cleaning operations.

PROTECTIVE HELMET IS MANDATORY
During every generator tran sport or handling operation

PROTECTIVE MASK IS MANDATORY
During maintenance and cleaning operation on the flues.

2.3 Intended use of the generator

The generator produces low pressure hot water and is suitable for non-pulverised solid fuel combustion with mechanised feeding.
Any other use is improper.

2.4 Improper use of the generator

Installing the generator outdoors exposed to weather agents represents a case of **improper use.**

The use of large size wood or other similar products is also considered i**mproper use.**

3. FUNCTIONING, TECHNICAL FEATURES AND DIMENSIONS

3.1 Generator operation illustration

The generator is a three flue passes type for the production of hot water for residential and industrial heating.

3.2 Generator operation description

The fuel descends by gravity from the hopper into the upper feeding screw, where it is pusher into the star valve (optional) falling then into the burner feeding screw.
The star valve (optional) has a double function. On one hand, it doses the fuel towards the burner feeding screw while, on the other it breaks fuel continuità between the two feeding screws, thereby preventing fume back flow and flames that could reach the fuel hopper.
The rotation speed of the lower feeding screw determines the correct brazier feeding and is therefore an essential element for the correct operation of the boiler.
The fuel contained in the brazier is burnt through the primary and secondary air input.
The heat that develops in the combustion chamber is conveyed in the interspace full of water through the steel walls of the generator.
The hot fumes pass from the combustion chamber through the central tube and, by means of the hollow space in the upper door, cross the tube nest and are finally espelle in the fume pipe fitting, making those three flue passes that are distintive mark of this type of heat generator.
Optimal combustion control is obtained adjusting the primary and secondary air and the amount of fuel. Combustion quality can be verified either visually or by means of smoke analysers.

3.3 Technical features

Tables 3.3.1 and tab.3.3.2 show in detail the CS Small technical data. For further information please contact the D'ALESSANDRO TERMOMECCANICA technical office.

MODELLI CALDAIE / MODELS BOILERS		***CS Small 20***	***CS Small 30***	***CS Small 45***	***CS Small 60***	***CS Small 80***	***CS Small 100***
potenza nominale *nominal output*	(kW)	20	30	45	60	80	100
potenza al focolare *firebox output*	(kW)	23,5	34,9	52	71	94	115
pressione max esercizio *max operating pressure*	(bar)	3					
pressione di prova idraulica *hydraulic test pressure*	(bar)	4,5					
temperatura max esercizio *max operantig temperature*	(°C)	90					
tensione di rete *net tension*	(V)	230 - 50 Hz					
assorbimento utenze elettriche (esclusi optional) *electric power absorption*	(kWh)	0,27			0,3		
comsumo combustibile a regime (¹) *combustible consumption at max work*	(Kg/h)	4,8	7,1	10,6	14,4	19,2	23,4
consumo medio giornaliero *average daily consumption*	circa il 30% del consumo a regime *approximately 30% of consumption at max work*						
combustibile di riferimento *combustible reference*	pellet di legna secondo EN14962-2 *wood pellet according to EN14962-2*						
pezzatura combustibile *size combustible*	secondo EN14962-2 *according to EN14962-2*						
altri combustibili utilizzabili *other usable combustibles*	noccioli di frutta, sansa e altri combustibili solidi triti di origine legnosa *nut shells, almond shell and other solid combustibles tritiums of wooden origin*						
perdita di carico lato acqua (10K) *loss of head side water (10K)*	(mbar)	13	20	32	72	87	109
perdita di carico lato acqua (20K) *loss of head side water (20K)*	(mbar)	7	8	13	31	49	61
temperatura minima attivazione pompa *minimal temperature activation pump*	(°C)	40					
contenuto acqua caldaia *water boiler capacity*	(l.)	60	75	100	130	160	195
temperatura media fumi (a caldaia pulita) *average smoke temperature flue (to clean boiler)*	(°C)	170 (±20%)					
depressione tiraggio min. camino *depression flue chimney*	(Pa)	-20 (±30%)					
diametro camino fumi (Øe camino) *diameter chimney (Øe chimney)*	(mm)	160			200		
portata fumi a 180°C *smoke range at 180°C*	(Nm³/h)	36	52	71	107	142	173
portata valvola di scarico termico (dT=80°C a 1,5 bar) *range thermal relief valve*	(l./h)	483			1320		
volume camera di combustione *volume combustion chamber*	(dm³)	120	160	195	225	290	355
volume tramoggia combustibile *max capacity hopper*	(dm³)	190					
massa a vuoto caldaia (tolleranza ± 5%) *mass boiler empty (tollerance ± 5%)*	(Kg)	310	360	410	540	590	640

(¹) il p.c.i. (potere calorico inferiore) di riferimento del combustibile è pari a 17.6 MJ/Kg (4.9 kWh/kg), come da prospetto 8 della Norma EN303-5 per il combustibile di prova di tipo "C" - The p.c.i (inferior heating power) the combustible is equal to 17,6 MJ how the prospect 8 the rule EN303-5 fuel test type "C"

tab. 3.3.1

3.4 List of components and spare parts

The main CS Small generator components are shown in the figures below:

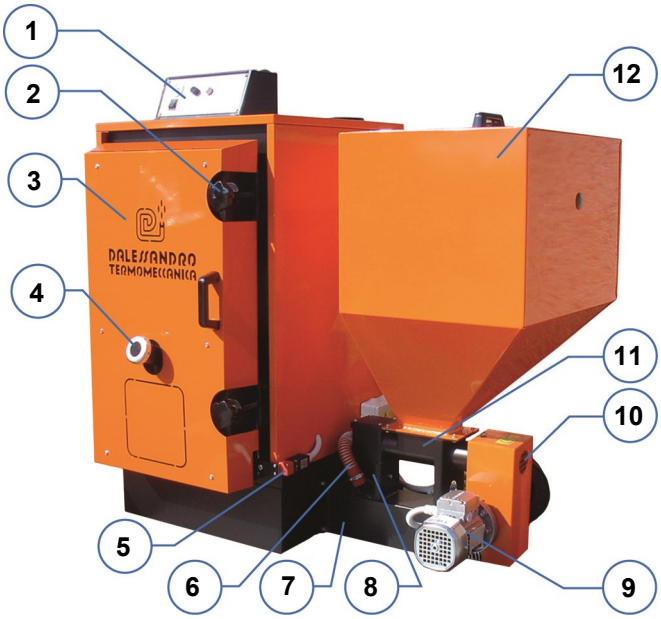


fig. 3.4.1

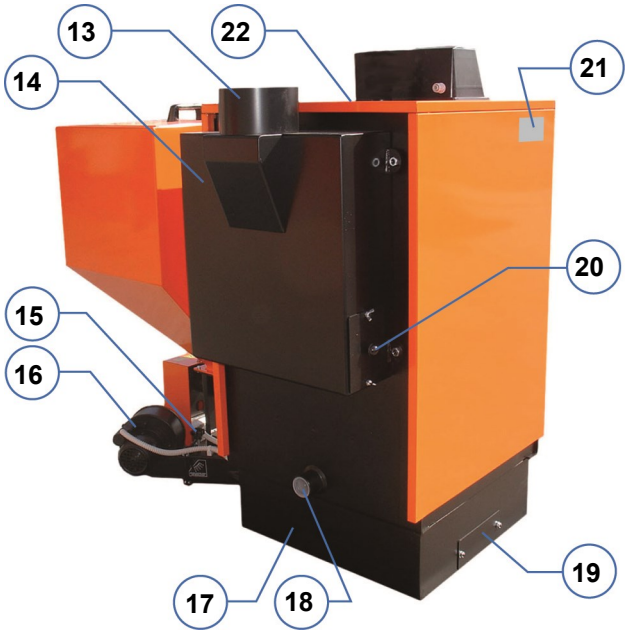
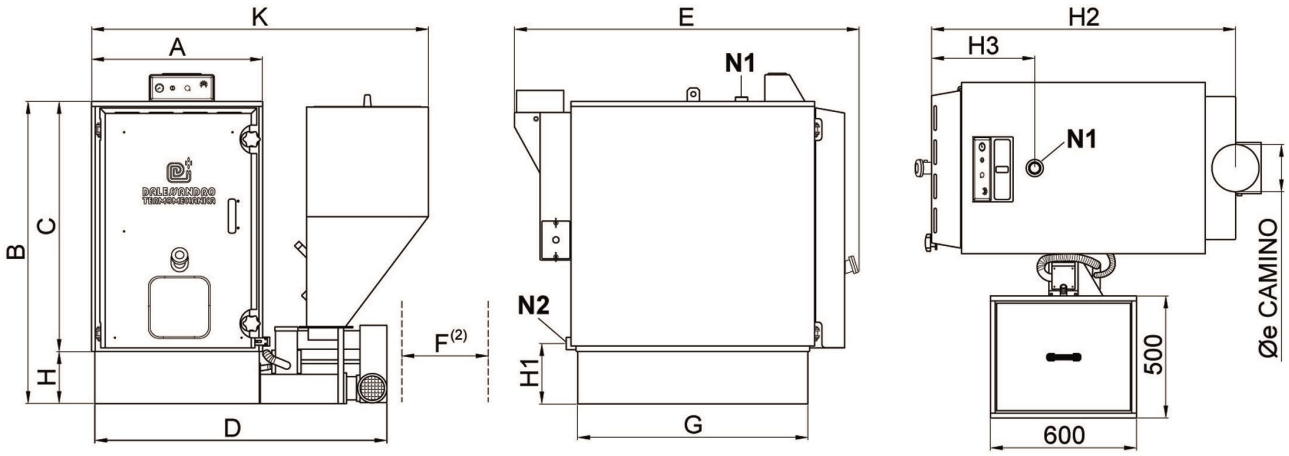


fig. 3.4.2

POS	DESCRIPTION
1	Control panel
2	Knob for opening door
3	Front door
4	Inspection window
5	Safety limit switch
6	Fume no-return pressure tube
7	Feeding screw tube
8	Tubular space between upper and lower screws
9	Feeding screw gearmotor
10	Transmission protection carter
11	Upper screw tube
12	Fuel hopper
13	Fume pipe fitting
14	Rear fume door
15	Comburent air adjustment knob
16	Comburent air fan
17	Burner basement
18	Water inlet manifold
19	Under burner cleaning flange
20	Cover for ash cleaning
21	Identification plate
22	Hot water outlet maniforld

The list of parts will be subsequently mentioned for identifying spare parts and as a reference for descriptions in the following chapters.

3.5 General dimensions



MODELLI / MODELS		*CS Small 20*	*CS Small 30*	*CS Small 45*	*CS Small 60*	*CS Small 80*	*CS Small 100*
DIMENSIONI / DIMENSION							
A	(mm)	700					
B	(mm)	1330			1355		
C	(mm)	1025					
D	(mm)	1200					
E	(mm)	880	1000	1100	1200	1400	1600
F(2)	(mm)	500					
G	(mm)	400	520	620	720	920	1120
K	(mm)	1390					
H	(mm)	175			215		
H1	(mm)	225			265		
H2	(mm)	740	860	960	1060	1260	1460
H3	(mm)	360	440				

(2) Corrisponde allo spazio minimo per l'estrazione della coclea in caso di manutenzione - Minimal dimension for extractiong and maintenance cochlea

tab. 3.5.1

3.6 Hydraulic connections

Table **3.6.1** referring to **fig.3.5.1 and fig.3.5.2**, summarises all the hydraulic connections present on the generator according to the model.

POS. *Pos.*	**DESCRIZIONE** *description*	**TIPO** *type*	**Q.tà** *Q.ty*	**DIMENSIONI (ISO7/1 - DN)** *dimension (ISO7/1 - DN)*
N1	mandata *outlet water*	manicotto *socket*	*1*	*40*
N2	ritorno *inlet water*	manicotto *socket*	*1*	*40*

tab. 3.6.1

4. FUELS

4.1 Fuels used

Crushed solid fuel based on wood can be used, such as:

- Wooden pellets
- Crushed almond, walnut and hazel nut shells
- Exhaust olive residues
- Crushed olive stones
- Crushed peach, apricot and other similar stones

The nominal power of generators is guaranteed with a biomass fuel humidity not over 10-15%.

4.2 Other fuels

For fuels not included in section 4.1 and 4.2, please contact our technical office.

5. TRANSPORT AND HANDLING

5.1 General information

The heat generator is supplied fully assembled and ready for installation, protected by packaging material and fixed to a wooden pallet for handling by means of a forklift.

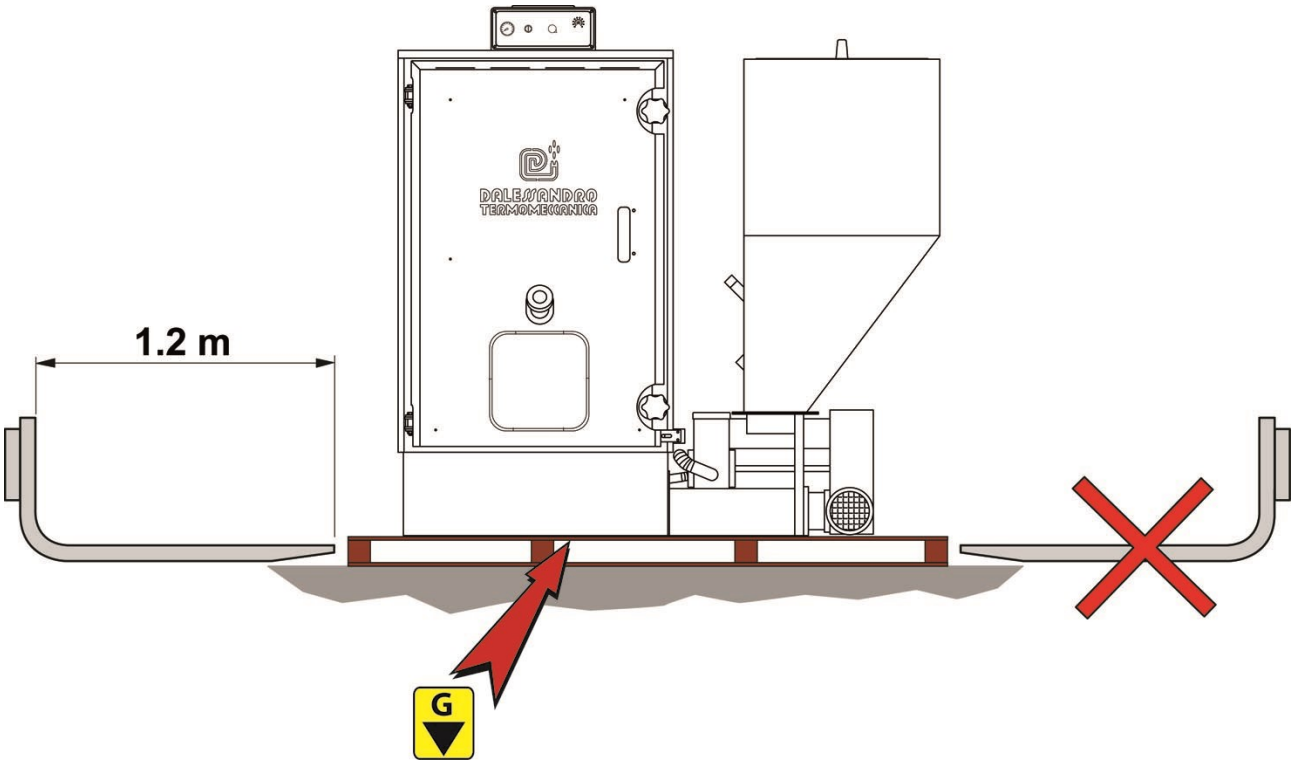
CAUTION !!

TRANSPORT AND HANDLING MUST BE CARRIED OUT BY QUALIFIED PERSONNEL WITH ADEQUATE LIFTING MEANS AND PERSONAL PROTECTION EQUIPMENT

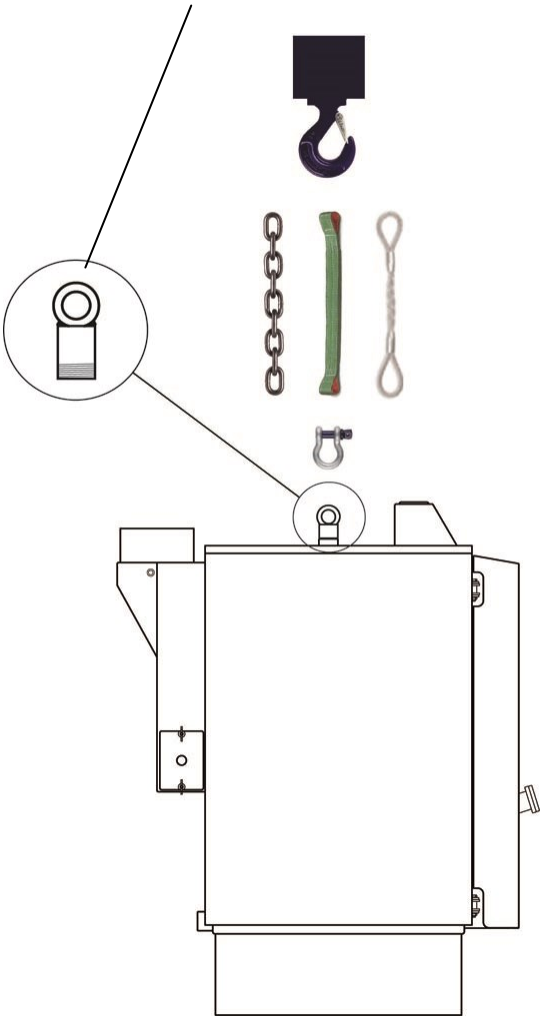
5.2 Transport and Handling

Transport and handling operations must be carried out by qualified personnel with adequate lifting means. The generator is equipped with eyebolts (fig.5.2.1) for hooking with cables, ropes or chains adequately chosen for lifting the generator. We recommend using certified lifting means and consultino the load tables indicated by the manufacturer. To lift the generator, refer to te unladen weight indicated on the identification plate for each type. Examples referring to lifting operations for the various models are provided in the pages that follow.

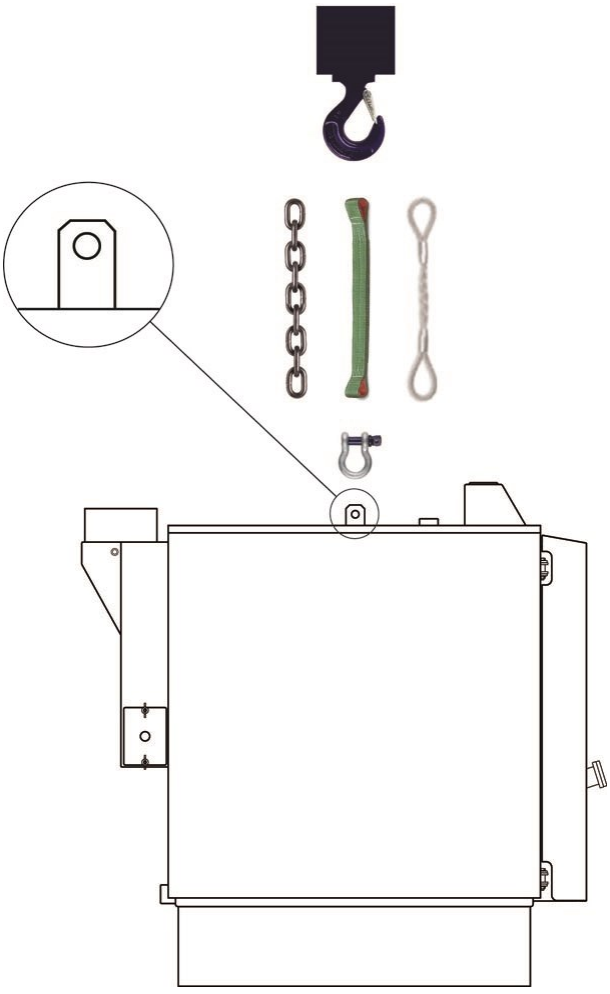
fig. 5.2.1



Lifting hook supplied by D'Alessandro Termomeccanica



models 20-30-40



models 60-80-100

6. INSTALLATION AND TESTING

6.1 General installation requirements

The electrical and thermo-hydraulic installation of the heat generator and any other assistance or maintenance operation must be carried out by personnel registered in the professional register established at the Chamber of Commerce, in compliance with Ministerial Decree **37/08.**
The thermo-hydraulicand electrical installers must release a Cartification of Conformity in compliance with **Ministerial Decree 37/08** and implementation regulation.
The person responsible for conducting a thermal plant with a capacity of over **200.000 kcal/h** (232,5 kw) must be provided with a license.

6.2 Installer requirements. (ITALY)

The thermal plant, at the service of heat generator with power to firebox above **34.9 Kw** (30.000 Kcal/h), must be realised according to a project drawn up by qualified staff registered with a professional register.
The installer must, before installation, present to the territorially competent ISPESL, a plant report with project.
The thermal power stations with total nominal power of the firebox higher than **(115 KW) 100.000 Kcal/h** are subject to **F.P.C.** (Fire Prevention Certificate)
Before starting work it is necessary to present request of Project Review pursuant to Italian Presidential Decree 37/98 with methods envisioned in M.D. Int. 4/05/98.

Once installation is completed and upon re leasing the Certificate of Conformity, the installer must fill in the Central Heating system maintenance booklet in compliance with Presidential Decree 412/93.
The thermo-hydraulic system servicing the generator can be carried out either **open or closed expansion tank**. In either case, the installer must comply with the **ISPESL R Collection.**

6.3 Installer fulfillments (FOREIGN CONTRIES)

The realisation of heating and/or hot water production plants using generators of which in this manual, is not governed by even regulations among the various contries, therefore the installer in each contry will refer to that set out by the local regulations.

CAUTION !!

THE GENERATOR MUST BE INSTALLED BY QUALIFIED PERSONNEL FOR THE INSTALLATION OF THERMAL AND ELECTRICAL SYSTEMS

6.4 Locali

Heat generators with a firebox power supply over 34.9 KW (30.000 kcal/h) must be installed in adequate environments and must be separated from other rooms by means of REI 120 structures.

Each room must have a surface of at least 6 m^2 with flat flooring and with permanent openings of at least **1/30** of the room surface.
The heat generator must have a stable position and must be levelled.

6.5 Flue and draught

The flue is one of the most important elements for a correct generator operation.
In general a good draught is obtained when flue is thermally insulated, designed with a double wall and insulated to prevent the fumes from cooling, thus maintaining the pressure difference that allows the fumes to go up the flue to the external outlet.
We recommend using stainless steel for the parts in contact with the fumes in order to prevent acid condensation due to the features of the used fuel. The surrounding structures may effect the correct operation of the flue: e.g., the distance and height of nearby buildings; therefore, according to the regulations in force, the top of the flue must exceed the ridge of the roof or of any other building at a distance of less than 10 m by at least 1 m.

- An **excessive draught** will reduce the generator efficiency: part of the combustion gas is sucked in the flue together with the fuel particles before being fully burnt, thus increasing fuel consumption.
- A **poor draught** decreases the efficiency of the generator because it slows down the combustion producing smoke return.

The flue section must have the same diameter as the fume pipe fitting, narrower sections are not allowed. Moreover its weight must not lay on the fume pipe fitting in order to prevent collapses in the structure of the generator.
Fig.6.5.3 shows how to install it correctly.

The flue must be sized according to the generator section and firebox power supply by qualified personnel (see UNI 13384). For generators connected in parallel, each generator must have its own flue.
Due to the various installation places, during normal operation, the flue section and height must guarantee a minimum draught of - 20 Pa (±30) measured by applying a 1/4" hose connection to the manifold located on the side of lower door inspection window and by inserting a rubber pipe connected to a deprimometer (see fig. 6.5.1).
Should you not be able to obtain a sufficient draught, we recommend installing an electric fan for forced draught of the flue.

fig. 6.5.1

INSTALLAZIONE TIPICA CANNA FUMARIA
TYPICAL INSTALLATION OF SMOKE FLUE

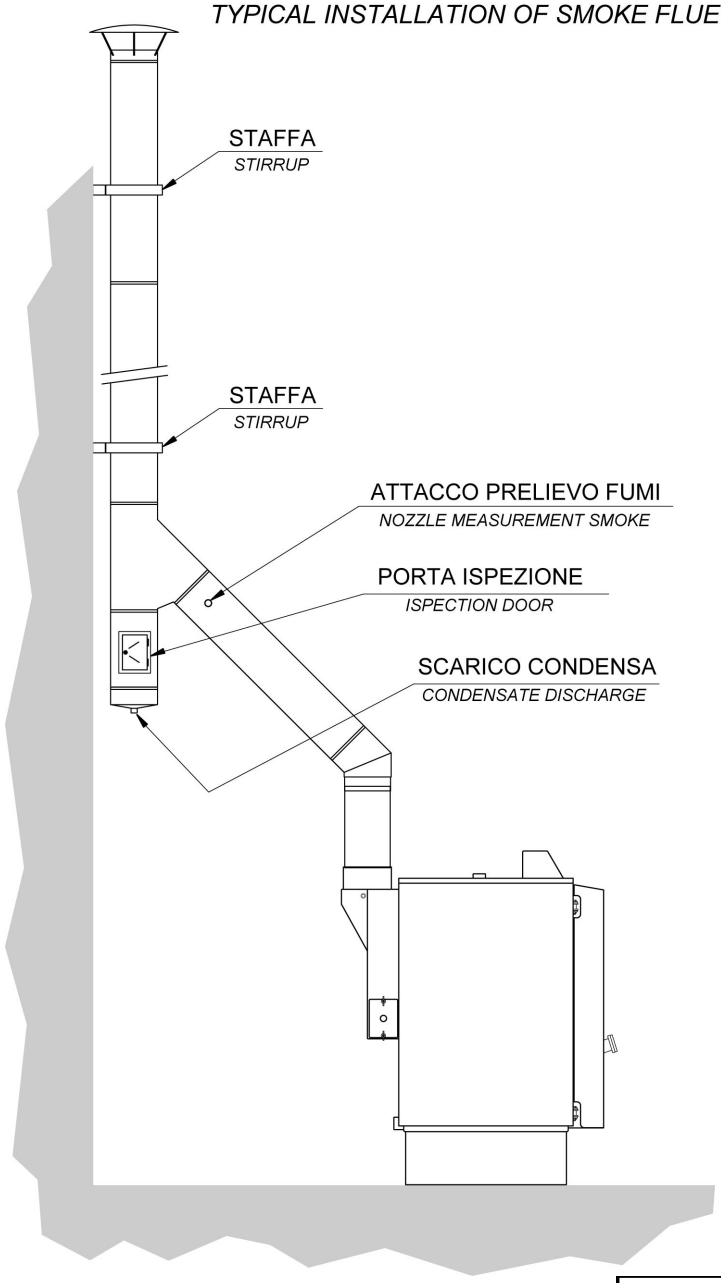


fig. 6.5.3

6.6 Electric plan and connections

The generator is equipped with a **non-automatic** main switch.
We recommend protecting the power supply line of the plant by means of a **differential magneto-thermal switch** with intervention threshold not higher than **30 mA**
All foreign masses and piping will be connected by means of equipotential pipe to a ground node.
Refer to the control unit manual as regards the electronic control connection.

6.7 Plant final testing

Only when the generator is completely installed, meaning positioned and levelled, connected to the hydraulic circuit, to the electric board and fed with suitable fuel, ignition can be carried out by qualified staff, recommended by the area dealer.
All above connections are the responsabilità of the final customer.

7. START-UP, IGNITION AND CHECKING

7.1 Commissioning checks

Before the generator commissioning it is essential to check that:

- The installer has issued regular Certification of Conformity
- The water plant is regularly filled with the correct level of liquid inside the OPEN or CLOSED expansion vessel
- The hopper is filled with suitable fuel (**see chapter 4**).
- The regulation thermostat is set to the maximum temperature value not higher than **90° C** and on the minimum temperature value not lower than **60°C**

7.2 Start-up

1. Fill the burner with fuel as indicate in **chapter 3.4.2** of the electronic board manual
2. Check, by opening the front door, that the combustibile level is at the base of the ignition plug (**fig. 7.1**)

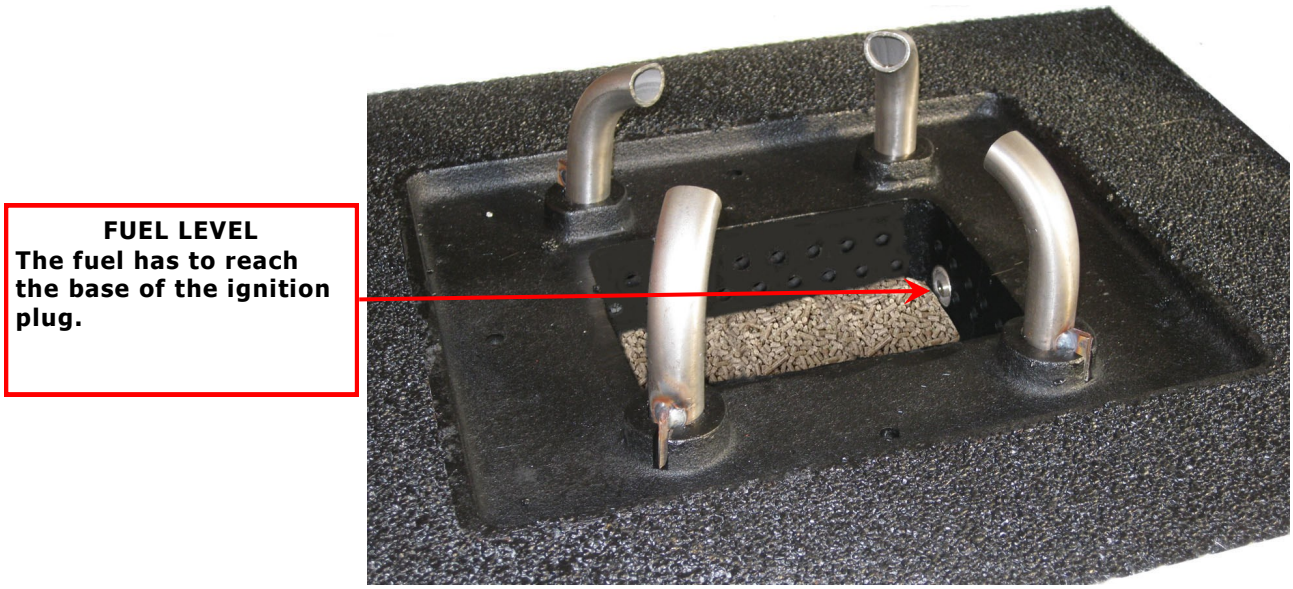


Fig 7.1 : CS SMALL 20-40 burner

NOTE: CS SMALL 60-100 burner has different dimensions and shape than fig. 7.1 but the main principle is the same. The burner has to be filled with fuel up to the base of the ignition plug.

4. Switch off the main switch and set the control board on automatic functioning as stated in **chapter 3.4.3** of the control board manual.

5. Close the lower door.
6. The start up procedure activates together with the comburent air fan and the feeding screw.
7. Regulate the primary and secondary air as indicate in this manual.

7.3 Regime functioning

After start-up and regulations, the heat generator functioning proceeds automatically.

7.4 Frequent heat request condition

During regime functioning the fuel conveying screw and the comburent air are regulated by a regulation thermostat:

- The screw and electric fans stop once the pre-fixed maximum temperature is reached
- When the water temperature has dropped by a few degrees, the screw and the fans automatically re-start until he subsequent reaching of the pre-fixed maximum temperature

7.5 Carburation

Usually, the correct combustion is obtained upon reaching of the correct ratio between fuel amount and comburent air amount. In ideal combustion conditions, a clear and luminous flame is generated, easily visible from the porthole. (**fig.3.4.1 pos.1 - fig.3.4.2 pos.1**)

7.6 Comburent air regulation

The correct amount of primary and secondary comburent air depends on the type and consistency of the used fuel. Excellent combustion will be obtained after repeated adjustment interventions, conditioned by the used fuel.
The combutrent air is regulated manually by acting in the knob indicated in **fig. 7.6.2.** Once the fuel capacity has been fixed(see following paragraph 7.7) depending on the power of the boiler and the relative consumption (see **tab. 3.3.1 and tab.3.3.2**), the comburent air can be optimased with a minimum regulation at 1 and maximum at 2. (**fig.7.6.1**). It may be necessary in some situations to set an higher level for the positioning of the comburent air indicator.

CAMPO DI REGOLAZIONE ARIA COMBURENTE
REGULATION RANGE COMBURENT AIR

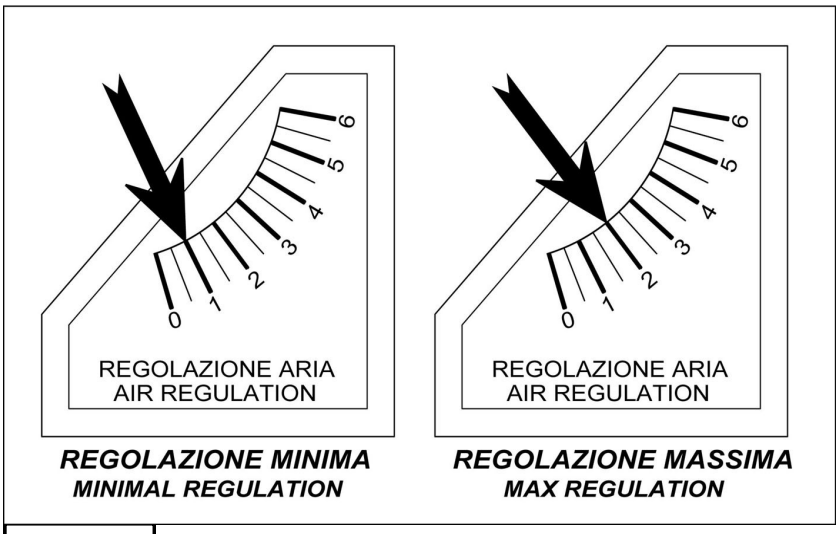


fig. 7.6.1

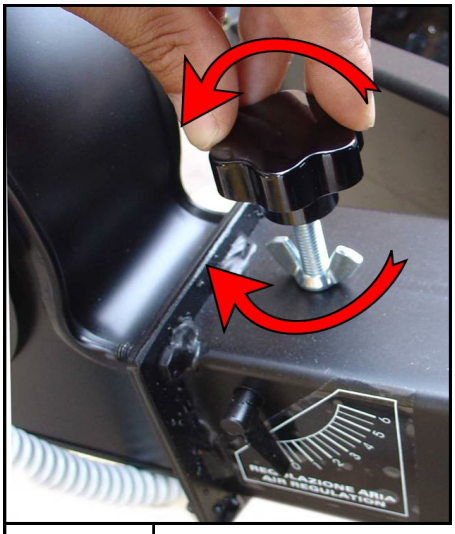


fig. 7.6.2

7.7 Regulation of the feeding screw fuel

A **screw potentiometer** regulates the amount of fuel (**fig 7.4**). It is already set on a value corresponding to the power of heat generator model, see **tab.7.7** below.
Small fuel regulation are allowed through the **screw potentiometer** using a screwdriver.
The fuel amount increases turning it clockwise, it decreases when turned anticlockwise.
The fuel conveying capacity, measurable in mc/h or kg/h, depends on the apparent mass density of the fuel and the number of turns of the screw; reference is made to the wood pellet having a lower heating value (l.h.v.) of 17.6 MJ/Kg (4.9 KWh/Kg) as from prospectus 8 of standard EN303-5 for the fuel of test "C", approximate dimensions Ø6 x 25mm and an apparent mass density between 600 and 660 kg/mc.

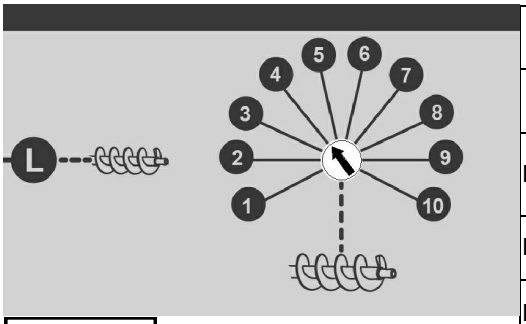


fig. 7.4

FUEL REGULATION		
	min Hz	max Hz
mod.CS SMALL 20	**12**	**15**
mod.CS SMALL 30	**15**	**18**
mod.CS SMALL 40	**23**	**25**
mod.CS SMALL 60	**30**	**35**
mod.CS SMALL 80	**40**	**45**
mod.CS SMALL 100	**50**	**55**

Tab. 7.7

CAUTION !!
Do not, under any circumstance, exceed the maximum adjustment values l.h.v. of 4.9 kWh/kg.

In case of using solid fuels different from the fuel of reference (wood pellet) without certification, we recommend checking its l.h.v. in order to guarantee optimal performances. In case the fuel has l.h.v. different from that of reference (wood pellet), **tab. 7.7** will be merely indicative. Various attempts must be made to obtain an optimal regulation by carrying out the above-described operations.

7.8 Switch-off

To switch off the boiler the main switch has to be on "0" position. The switch off will be automatic if the fuel ends completely in the firebox.

8. CLEANING

8.1 General

The firebox and the flues must be periodically cleaned from combustion solid residues (ashes). Keeping the flues free from ashes ensures an effective draught and the best geerator efficiency. Table 8.1 lists the cleaning operations to be carried out in the chronological order.

CAUTION !!

BEFORE CLEANING, DISCONNECT THE ELECTRIC ENERGY FROM THE GENERATOR BY INTERVENING ON THE MAIN SWITCH AND ENSURE THAT THE RESIDUAL FUEL INSIDE THE FIREBOX IS OFF AND HAS COOLED DOWN

CLEANING THE FIREBOX **OPERATION**: Remove ashes from the upper part of the coombustion chamber, in correspondence to the tube nest, on the sides of the firebox and on the burner. We recommend to use an ash vaccum. Remove the air nozze and clean the incrustations. Remove possible incrustations on the holes of the firebox. **PERIODICITY**: 5 / 7 days **REFERENCE**: fig. 8.1 - fig.8.3
CLEANING OF THE TUBE NEST **OPERATION**: checking and cleaning the ashes in the tube nest opening the front door (pos.3-fig 3.4.1). Use the provided pipe brush inserting it in each tube and pushing the ash on the back part of the smoke fitting. In case the turbolators are inserted (optional) be careful to remove them from each pipe before cleaning. **PERIODICITY**: 5 / 7 days **REFERENCE**: fig. 8.2
SMOKE FITTING **OPERATION**: checking and cleaning of the ashes deposited on the lower part in correspondence of extraction doors. Remove the screws and extract the lids and suction ashes with a vacuum oir the provided pipe brush. **PERIODICITY**: 15 days **NOTES**: also periodically check the flue and seals along the path. **REFERENCE**: fig. 8.4
BURNER BASEMENT AIR PIPES **OPERATION**: remove screws and lid from the basement, remove ashes by using a vacuum. **PERIODICITY**: 30 / 60 days **REFERENCE**: fig. 8..5

FUEL HOPPER

OPERATION: checking and cleaning of the empty hopper from dust and incrustation due to humidity and to the type of the used fuel.
PERIODICITY: 30 / 60 days
NOTES: check the fuel does not contain foreign bodies that could damage the screws.
REFERENCE: fig.3.4.1 pos.12

tab. 8.1

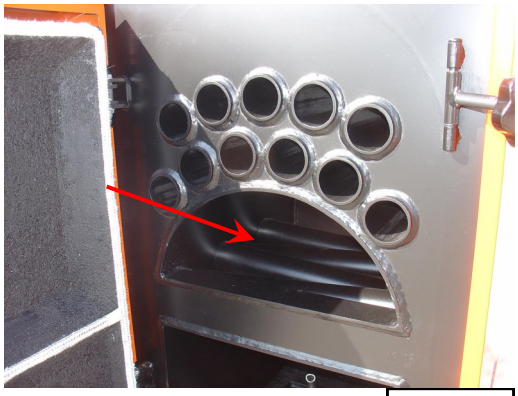


fig. 8.1

fig. 8.2

fig. 8.3

fig. 8.4

fig. 8.5

During all cleaning and maintenance operations we recommend restoring the status of the seals of the lids in the original dismanting conditions, to avoid emission of dust and/or fumes inside the thermal power station. If the seals are damaged it will be necessary to replace them.

In addition to the previous cleaning and maintenance operations, it is important to remove dust on the thermal power station floor and on the boiler external parts, to avoid dangerous concentrations in the air that might trigger denotation or fire.

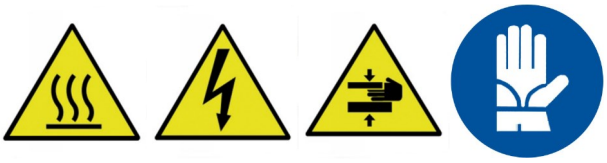
9. MAINTENANCE

9.1 General

The heat generator must be submitted to regular maintenance to guarantee the efficiency of all the components determining the correct operating of the generator and its main yield. T**ab.9.1** summarises the main operations.

ATTENTION!!
MAINTENANCE MUST BE CARRIED OUT ONLY BY QUALIFIED STAFF

ATTENTION !!
BEFORE PERFORMING MAINTENANCE OPERATIONS , DISCONNECT THE POWER SUPPLY FROM THE GENERATOR BY INTERVENING ON THE MAIN SWITCH AND ENSURE THAT THE RESIDUAL FUEL INSIDE THE FIREBOX IS OFF AND HAS COOLED DOWN



OPERATION	OBJECT OF THE CHECK	PERIODICITY	ACTIONS TO TAKE	REFERENCE
CHECK	COMBURENT AIR FAN	BEGINNING SEASON	check that the fan turns and do not cause vibrations, in case remove the excess dust and dirt.	Pos.16 - fig.3.4.2
LUBRICATION	AIR VENTILATION PIPES BLADES	BEGINNING SEASON OR AFTER A LONG INACTIVITY PERIOD	Lubricate the rotary transversal pin of the internal blade of the comburent air pipe using spary oil or a brush	-

tab.9.1

10. ANOMALIES, FAULTS AND MALFUNCTIONING - FAQ AND ANSWERS

10.1 Anomalies and faults table. FAQ and answers

ATTENTION!!
BEFORE PERFORMING THE OPERATIONS DESCRIBED IN CHAP. 10, DISCONNECT THE ELECTRIC ENERGY FROM THE GENERATOR BY INTERVENING ON THE MAIN SWITCH AND ENSURE THAT THE RESIDUE FUEL INSIDE THE FIREBOX IS OFF AND HAS COOLED DOWN

SIGN	PROBABLE CAUSES	SOLUTIONS
Insufficient conveying of fuel	a) check there is enough fuel inside the hopper.pos.12 fig.3.4.1,	a) fill the hopper with fuel.
	b) check there are no objects inside the hopper pos.12 fig.3.4.1, preventing the descending of the fuel or that the same fuel has formed bridges.	b) re-mix the fuel inside the hopper
	c) check geared motor functioning pos.9 fig.3.4.1, specifically observing whether the motor turns, as well as the transmission chain pinion.	c) ensure that the motor is powered or call the technical after-sales assistance.
	d) removing the carter pos.10 fig.3.4.1, check that the safety bolt (fig.10.1) fixing the pinion to the secondary shaft is not broken.	d) in case of empty rotation, meaning breaking of the bolt, call the technical after-sales assistance.
	e) removing the carter pos.10 fig.3.4.1 check that the transmission chain does not jump out from the pinion teeth due to no tension	e) call the technical after-sales assistance.
Insufficient air for combustion	a) check operating of the fan pos. 16 fig.3.4.2 is not prevented from foreign bodies inside the grid or that the motor is correctly powered.	a) remove any foreign bodies and check that the electric connector is connected. Should the problem persist, call the technical after-sales assistance.
	b) check that regulation knob pos.15 fig.3.4.2 regulating the opening of the blades loosens and tightens and that the blades are not blocked by deposits, dust or other	b) clean the knob threading by removing the deposits and lubricate,. On the contrary, call the technical after-sales assistance.
	c) make sure that the burner holes are not logge by fuel residues	c) carry out cleaning operations described in **chapter 8**
	d) check for the presence of dust on the fan blades	d) remove dust using compressed air

tab. 10.1

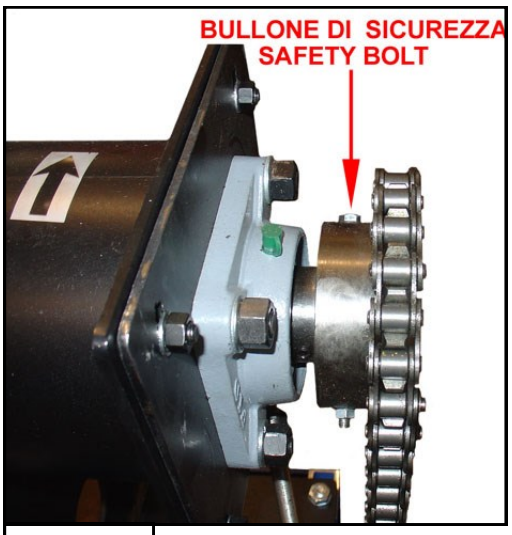


fig. 10.1

10.2 Table of mulfunctions. Questions and answers

PROBLEM	POSSIBLE CAUSE	SOLUTION
Smoke returns inside the fuel hopper	a) make sure that the flue draught is that required in table 3.3.1	a) If not, refer to qualified personnel
Incorrect combustion	a) check the balance between fuel flow rate and air low rate referring to **Chapter 7**	a) Should the problem persist, call for technical assistance

11. NOISE

11.1 General information
The generator acoustic pressure levels are not significant.

11.2 Sound emission values
Measurements carried out in typical environment (thermal station of over 6 sqm) have shown continuos sound pressure levels Leq,d and peak values below 76 dB(A)

12. DECOMMISSIONING AND SCRAPPING

12.1 General information
The generator is fully made of ferrous materials and does not contain any hazardous material of environment.

12.2 Scrapping
Once the generator is decommissioned, it is considered "Waste" according to the Legislative decree n. 152 dated 3 April 2006 and must be handed to Companies that have Regional Authorization for waste collection.

NOTES

DECLARATION OF CONFORMITY

D'Alessandro Termomeccanica
C.da Cerreto, 55 - 66010 MIGLIANICO (CH)

DECLARES

Under his owjn exclusive responsabilità that

SOLID FUEL BOILERS
With AUTOMATIC FEEDING

Series CS Small
Models 20-30-45-60-80-100

Serial number XXXXX

To which this declaration refers to

COMPLY WITH

Directive 2006/42/CE (Machine Directive), Directive 2006/92/CE (Electrical material safety), Directive 2004/108/CEE (Electromagnetic compatibility) integrated by CE marking.
The harmonised standards or the technical specifications (designations) regarding product safety in force in the EU that have been applied in compliance with the state of the art are:

EN 60335.1
EN 60335.2.102
EN 6100-3-2
EN 55014.1
EN 6100-3-3
EN 55014.2

Miglianico lì_____

D'Alessandro Termomeccanica S.r.l.

D. COPY OF PARTIAL SWITCHING OFF DECLARATION

D'ALESSANDRO TERMOMECCANICA S.R.L.
Caldaie - Bruciatori - Generatori di aria calda / Boilers - Burners - Warm air generators
66010 MIGLIANICO (CH) Italy - C.da Cerreto, 55 - e-mail: info@caldaiedalessandro.it - web: www.caldaiedalessandro.it
Tel. (+39) 0871 950329 - Fax (+39) 0871 950687 - P.iva / C.F.: 02301160699 - Capitale sociale € 3.050.000 i.v.

La D'ALESSANDRO TERMOMECCANICA S.r.l.

dichiara che:

i generatori di calore della serie CS Small alimentati da combustibili solidi non polverizzati ad alimentazione meccanizzata costruiti dalla D'ALESSANDRO TERMOMECCANICA S.r.l. :

a) corrispondono alla definizione di cui al punto 1.6, della Raccolta R Ed. 2009 – Fascicolo R.3. – CAP. R.3.C.(Sistema di combustione a disinserimento parziale)
b) sono dotati, se di potenza nominale superiore a 100 kW di dispositivo di dissipazione della potenza residua di cui al punto 1.8, della Raccolta R Ed. 2009 – Fascicolo R.3. – CAP. R.3.C.

Miglianico (CH) 09/09/11

In fede

D'ALESSANDRO TERMOMECCANICA S.r.l.

D'ALESSANDRO TERMOMECCANICA S.R.L.
Amministratore Unico
Raffaele D'ALESSANDRO